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K. A. ANDRIAMOV'S WORK IN THE FIELD OF HIGH-MOLECULAR COMPOUNDS, DIELECTRICS

K. A. Andrianov was elected Corresponding Member of the Academy of Sciences USSR in the specialty of chemical technology at a meeting of the Department of Chemical Sciences of the Academy held on 19-20 October 1953.

Andrianov is a scientist who is active in the fields of synthesis and technology of high-molecular compounds and dielectrics. Starting in 1937, Andrianov published a series of papers on organosilicon compounds. As a result of the work on organosilicon compounds done by Andrianov, this branch of chemistry has been advanced considerably. Andrianov's first investigations on the mechanism of the hydrolysis and condensation of alkyltriethoxysilanes were published in 1938. In these investigations he demonstrated for the first time that there is formation of siloxane bonds during the process of hydrolysis, and that as a result of the formation of these bonds polyorganosiloxanes are formed. He also demonstrated that although the size of a saturated organic radical is without influence on the chemical character of the condensation process, it does affect the velocity and extent of the saponification of the ethoxyl groups. Furthermore, in the case of compounds which contain unsaturated radicals, there is polymerization in addition to condensation. The relationships discovered by Andrianov were amplified by him further in the course of research on polymers formed from phenyltrichlorosilane and diphenyldichlorosilane.

The result of the investigations described above furnished the basis for work that was carried out by Andrianov and resulted in the development of organopolysiloxane resins, coating materials, liquids, and insulating substances. In the fundamental treatise, <u>High-Molecular Organosilicon Com-</u> pounds [Kremneorganicheskiye Vysokomolekulyarnyye Soyedineniya] published in 1949, Andrianov discusses methods for the synthesis of monomers, problems pertaining to the investigation of reactions leading to the formation of polyorganosiloxanes of various types, and physicochemical, mechanical, and dielectric properties of various polyorganosiloxanes. In 1951 he published work on the chemistry of polyorganosiloxanes, in which he proposed a condensation-polymerization mechanism for their formation.

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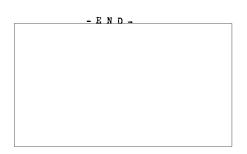
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Andrianov has also done extensive work on the chlorination of diphenyl. The most important result of this work was the isolation of a definite type of polychlorodirhenyls, the mixtures of which have no tendency to crystallize. The work done by Andrianov in this field served as a basis for the development of a new liquid dielectric, sovol.

In 1932-35 Andrianov published a series of papers on high-molecular compounds which dealt with the kinetics of the condensation of phenols with acrolein and other aldehydes in the presence of acidic or alkaline catalysts.

In the course of work on the preparation of soluble resins, Andrianov synthesized oil-soluble hexylphenol-formaldehyde resins and aniline-formaldehyde resins. Of particular significance is Andrianov's work on the reactions leading to the formation of polyvinylacetal resins and the creation, on the basis of these resins, of the insulating coating viniflex for electric wires.

His investigations in the field of electrical insulation are well known. They are published in the form of articles and monographs. In a number of his published works Andrianov examines general theoretical problems pertaining to dielectrics; discusses the heat stability, chemical stability, resistance to moisture, resistance to fire, and dielectric properties of substances suitable for use as dielectrics; and makes definite conclusions in regard to the direction which future work must take if it is to result in the development of the most effective dielectrics. The new electric insulating materials developed by Andrianov personally of under his direction are being applied at present on an extensive scale in the electrical industry.



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